i. means for powering at least three independent freedoms of said connection element relative to said ground; and

ii. means for maintaining at least one independent freedom of said connection element relative to said ground free of power.

2. The apparatus of claim 1, wherein said means for powering said freedoms powers said freedoms based on a signal generated in a non-local environment.

3. The apparatus of claim 1, at least one of said powered freedoms comprising a translation relative to said ground.

4. The apparatus of claim 1, said at least one freedom that is free of power comprising a rotation with respect to said ground.

5. The apparatus of claim 1, said linking means comprising means for powering at least four freedoms of said connection element relative to said ground.

6. The apparatus of claim 1, said linking means comprising means for powering five independent freedoms of said connection element relative to said ground.

7. The apparatus of claim 1, said linking means comprising at least two linked orthogonal bearings.

8. The apparatus of claim 1, said linking means comprising first and second linked orthogonal bearings and a third bearing, which is linked to and orthogonal to one. of either the first or second linked bearings.

9. The apparatus of claim 1 said linking means comprising at least two linked bearings.

10. The apparatus of claim 1, said linking means comprising a pair of actuators that are movable relative to each other and relative to a link more proximal to said ground than said pair of actuators.

11. The apparatus of claim 10, said pair of actuators being both connected to said link more proximal to ground through a single cable.

12. The apparatus of claim 1, said linking means comprising at least two masses that are movable relative to ground and each other and said connection element so that the center of mass among said at least two masses and the connection element remains substantially stationary relative to ground despite motion of said connection element.

13. The apparatus of claim 12, at least one of said masses comprising an actuator.

14. The apparatus of claim 1, said connecting means comprising a five bar linkage.

15. The apparatus of claim 13, four bars of said five bar linkage defining a plane, said four bars being connected to ground, rotatably about an axis perpendicular to said plane.

16. The apparatus of claim 1, said connecting element comprising a thimble.

17. The apparatus of claim 1, said connecting element comprising a rod.

18. The apparatus of claim 5, said connecting element comprising a rod.

19. The apparatus of claim 6, said connecting element means comprising a rod.

20. The apparatus of claim 1, said connecting element sized to engage a human finger.

21. The apparatus of claim 1, said connecting element sized to engage a human foot.

22. The apparatus of claim 1, said connecting element sized to engage a body member of said user selected from the group consisting of a human foot, finger, hand, head, buttocks, arm, leg, tongue and toe.

23. The apparatus of claim 1, said linking means further comprising:

a. means for tracking the motions of said connection element relative to said ground with respect to said at least three freedoms that are powered; and

b. means for generating a signal based on said tracked motions.

24. The apparatus of claim 1, said ground located above said connection element, with respect to a gravitational field.

25. The apparatus of claim 1, said linking means further comprising means for linking to a different portion of said user's body from said body member, such that said ground is said different portion of said user's body.

26. The apparatus of claim 1, said connection element comprising an element that bears compression.

27. The apparatus of claim 1, said connection element comprising an element that bears tension.

28. The apparatus of claim 1, said connection element comprising means for exchanging an attractive force and a repulsive force with said user.

29. An apparatus for physically exchanging a force with a user in a first, user-local environment, said apparatus comprising:

a. a connection element for physically connecting to a body member of said user; and

b. means for physically linking said connection element to a ground, said linking means comprising:

i. means for powering three independent freedoms of said connection element relative to said ground; and

ii. means for maintaining three independent freedoms of said connection element relative to said ground free o f power.

30. A user input apparatus comprising:

a. a user connection element;

b. a linkage for connecting said user connection element to ground, said linkage comprising:

i. a connection assembly, comprising:

(a). a first link;

(b). a first rotational bearing, one side of which is connected to said connection element and the other side of which is connected to one end of said first link;

(c). a second rotational bearing, one side of which is connected to a second end of said first link and the other side of which is connected to a second link, said second bearing arranged relative said first bearing such that their axes of rotation are orthogonal and intersect; and

(d). a third rotational bearing, one side of which is connected to a second end of said second link, said third bearing arranged relative to said second bearing such that their axes of rotation are orthogonal and intersect, and arranged relative to said first bearing, such that their axes of rotation intersect.

ii. four bars, linked in a series having first and last bars, an extension of one of said bars being connected to the other side of said third bearing;

iii. an axle that is fixed relative to a link that is more proximal to ground than said axle, said first and last bars of said linked series being linked by said axle;

iv. a first actuator, connected between said first bar of said four bar series and said link more proximal to ground than said axle;

v. a second actuator, connected between said link more proximal to ground than said axle and a bar of said four bar series other than said first bar of said series; and

vi. a third actuator, connected between ground and said link more proximal to ground than said axle.

31. The apparatus of claim 30, said first and second actuators being connected to said link more proximal to ground than said axle through a single cable.

32. An apparatus for a user in a local environment to transmit a signal to and receive a signal from a non-local environment, said apparatus comprising:

a. a connection element for physically connecting to a body member of said user;

b. means for mechanically linking said connection element to a ground, said linking means comprising:

i. means for powering at least three independent freedoms of said connection element relative to said ground to an extent based on a signal from said non-local environment;

ii. means for tracking said at least three powered independent freedoms;

iii. means for generating a master signal based on said tracked at least three freedoms; and

iv. means for maintaining at least one independent freedom of said connecting element relative to said ground free of powering;

c. means for communicating said master signal said means for tracking to said non-local environment; and

d. means for communicating said non-local signal from said non-local environment to said means for powering.

33. The apparatus of claim 32, wherein said means for powering at least three independent freedoms powers said freedoms to an extent based on said non-local signal.

34. The apparatus of claim 33, said linking means comprising means for maintaining three independent freedoms of said connection element relative to said ground free of powering.

35. The apparatus of claim 33, said linking means comprising means for maintaining at least two independent freedoms of said connection element relative to said ground and free of powering.

36. The apparatus of claim 32, said linking means comprising at least two linked orthogonal bearings.

37. The apparatus of claim 32, said linking means comprising a pair of actuators that are movable relative to each other and a link more proximal to said ground than said actuators.

38. An apparatus for generating a signal at a specified point, said apparatus comprising:

a. a first actuator connected through a cable to a ground;

b. a second actuator connected to said ground through said cable;

c. means for kinematically connecting said first actuator to said specified point; and

d. means for kinematically connecting said second actuator to said specified point.

39. The apparatus of claim 38, said means for connecting said first actuator to said specified point comprising a first bar of a five bar linkage.

40. The apparatus of claim 39, said means for connecting said second actuator to said specified point comprising a second bar of said five bar linkage.

41. The apparatus of claim 40, said bars of said five bar linkage having lengths and masses such that the center of mass among said actuators, bars and specified point remains substantially stationary, despite any relative movement of said actuators, bars and point.

42. An apparatus for generating a signal representative of force comprising:

a. a receiver for receiving a signal representative of the location of a user reference point relative to a user reference frame;

b. a geometry model residence for storing a representation of:

i. a non-local reference frame;

ii. the user reference frame, relative to said non-local reference frame; and

iii. the conformation of a non-local environment comprising a switch-type, spring-type element, relative to said non-local reference frame;

c. a comparator for comparing the location of the user reference point relative to the non-local environment; and

d. a force generator for generating a signal representative of a force, based on the location of the user reference point relative to the non-local environment and a set of force rules, including spring-force rules which specify a switch output force signal in response to a location signal of said user reference point indicative of a deflected conformation of said spring-type element, said switch output force signal being specified by a non-linear function.

43. The apparatus of claim 42, further comprising a non-local environment reaction calculator that makes changes to the representation of the conformation of the non-local environment based on the signal representative of force and the set of force rules.

44. The apparatus of claim 43, said spring force rules specifying a change in the representation of the conformation of the non-local environment in response to a location signal of said user reference point indicative of a deflected conformation of said switch-type element.

45. The apparatus of claim 44, said change in the conformation of the non-local environment comprising a change in the conformation of the representation of the switch type element.

46. The apparatus of claim 45, said switch-type element comprising a switch having at least two positions, said change in conformation of the representation of the switch type element comprising a change from one position to another of said at least two positions.

47. An apparatus for generating a signal representative of force comprising:

a. a receiver for receiving a signal representative of the location of a user reference point relative to a user reference frame;

b. a geometry model residence for storing a representation of:

i. a non-local reference frame;

ii. the user reference frame, relative to said non-local reference frame; and

iii. the conformation of a, non-local environment comprising a diagonal-type, spring-type element, relative to said non-local reference frame;

c. a comparator for comparing the location of the user reference point relative to the non-local environment;

d. a force generator for generating a signal representative of a force, based on the location of the user reference point relative to the non-local environment and a set of force rules, including spring-force rules which specify a diagonal element output force signal in response to a location signal of said user reference point indicative of a deflected conformation of said diagonal-type element; and

e. a non-local environment reaction calculator that makes changes to the representation of the conformation of the non-local environment based on the signal representative of force and the set of force rules, said diagonal element spring-type rule specifying a change in the representation of the cross-sectional area of a selected region of said diagonal-type element.

48. The apparatus of claim 47, said non-local environment further comprising an indicia of the cross-sectional area of said selected region of said diagonal-type element.

49. The apparatus of claim 48, said geometrical-model residence further comprising means for storing a representation of said indicia of the cross-sectional area of said diagonal-type element as it changes over time.

50. The apparatus of claim 47, said set of force rules including a plurality of selectable different spring-force rules that specify a diagonal element output force signal, thereby facilitating a plurality of relationships between said spring-force output signal and the location of said user reference point indicative of a deflected conformation of said diagonal-type element.

51. The apparatus of claim 47 said force generator further generating forces based on the time history of the location of the user reference point relative to the non-local environment and a set of force rules, including friction-type rules which specify a friction output force signal in response to the time history of the location signal of said user reference point indicative of a change in position over time of the user reference point.

52. An apparatus for generating a signal representative of force comprising:

a. a receiver for receiving a signal representative of the location of a user reference point relative to a user reference frame;

b. a geometry model residence for storing a representation of:

i. a non-local reference frame;

ii. the user reference frame, relative to said non-local reference frame; and

iii. the conformation of a, non-local environment comprising a drafting substrate-type element, relative to said non-local reference frame;

c. a comparator for comparing the location of the user reference point relative to the non-local environment;

d. a force generator for generating a signal representative of a force, based on the location of the user reference point relative to the non-local environment and a set of force rules, including drafting substrate-force rules which specify a drafting substrate output force signal in response to a location signal of said user reference point indicative of a deflected conformation of said drafting substrate-type element; and

e. a non-local environment reaction calculator that makes changes to the representation of the conformation of the non-local environment based on the signal representative of force and the set of force rules, said drafting substrate type-element rule specifying a change in the representation of a surface shape of a selected region of said drafting substrate-type element.

53. The apparatus of claim 52, said representation of said conformation of said drafting substrate-type element including a representation of a surface texture.

54. A method for physically exchanging a force between an apparatus and a user in a first, user-local environment, said method comprising the steps of:

a. providing an apparatus comprising:

i. a connection element for physically connecting to a body member of said user; and

ii. means for physically linking said connection element to a ground, said linking means comprising:

(a). means for powering at least three independent freedoms of said connection element relative to said ground; and

(b). means for maintaining at least one independent freedom of said connection element relative to said ground free of power;

b. connecting said connection element to a body member of said user;

c. powering said at least three independent freedoms of said connection element.

55. The method of claim 54, wherein said step of powering said freedoms comprises the step of generating a signal in a non-local environment and powering said freedoms based on said non-local signal.

56. A method for generating a signal representative of force, said method comprising the steps of:

a. receiving a signal representative of the location of a user reference point relative to a user reference frame;

b. storing a representation of:

i. a non-local reference frame;

ii. the user reference frame, relative to said non-local reference frame; and

iii. the conformation of a, non-local environment comprising a diagonal-type, spring-type element, relative to said non-local reference frame;

c. comparing the location of the user reference point relative to the non-local environment; and

d. generating a signal representative of a force, based on the location of the user reference point relative to the non-local environment and a set of force rules, including spring-force rules which specify a diagonal element output force signal in response to a location signal of said user reference point indicative of a deflected conformation of said diagonal-type element;

e. changing the representation of the conformation of the non-local environment based on the signal representative of force and the set of force rules, said diagonal element spring-type rule specifying a change in the representation of the cross-sectional area of a selected region of said diagonal-type element.

57. The method of claim 56, further comprising the step of maintaining in said representation of said non-local environment an indicia of the cross-sectional area of said selected region of said diagonal-type element.

58. The method of claim 57, further comprising the step of storing a representation of said indicia of the cross-sectional area of said diagonal-type element as it changes over time.

59. The method of claim 58, further comprising the step of displaying said representation of said indicia of the cross-sectional area of said diagonal-type element as it changes over time on a visual display.

60. The apparatus of claim 8, each bearing having an axis of rotation, said three axes of rotation coinciding at a user reference point.

61. The apparatus of claim 60, said connection element comprising a thimble into which said body member is inserted, said thimble arranged such that said user reference point is within said body member when connected to said thimble.

62. The apparatus of claim 61, said body member comprising a finger.